Claims

1. A diffuser for use in apparatus for extracting energy from a flow of liquid, said diffuser comprising a flow passage having an inlet and an outlet and a side wall or walls between said inlet and said outlet, said side wall or walls being defined by a plurality of members of an aerofoil cross section.

2. A diffuser as claimed in claim 1 wherein said aerofoil section members are arranged in series between said inlet and said outlet such that other than at the inlet and outlet, the trailing portion of one aerofoil section member is adjacent the leading portion of the immediately adjacent trailing aerofoil section member.

3. A diffuser as claimed in claim 2 wherein a gap is provided between a trailing portion of each aerofoil section member and the leading portion of the adjacent aerofoil section member whereby flow of fluid from outside of the diffuser can be introduced into the flow passage between the respective aerofoil section members.

4. A diffuser as claimed in any one of the preceding claims and including support means for rotatably supporting said diffuser whereby said diffuser may adjust to the direction of the flow of fluid.

5. A diffuser as claimed in claim 4 wherein said support means comprises a support pedestal to which the diffuser is mounted for rotation about a vertical axis.

6. A diffuser as claimed in any one of the preceding claims wherein said flow passage initially decreases in cross sectional area from the inlet to a constricted region between the inlet and the outlet and, thereafter, has an increasing cross sectional area rearwardly and away from the constricted region towards the outlet.

7. A diffuser as claimed in claim 6 wherein said aerofoil section members are arranged along a parabolic curve between the inlet and outlet.

8. A diffuser as claimed in any one of the preceding clams wherein said flow passage is of a substantially rectangular cross section, said diffuser having a pair of opposite spaced apart planar walls and a pair of opposite side walls defined by said aerofoil section members.

9. A diffuser as claimed in claim 8 wherein said spaced apart planar walls comprise upper and lower walls and wherein said acrofoil section members are oriented such that the leading and trailing ends of the aerofoil section members are substantially vertical and extend between the upper and lower walls.

10. A diffuser as claimed in any one of claims 1 to 7 wherein said flow passage is substantially circular in cross section with the side walls of the diffuser being defined by annular members of aerofoil cross section.

11. A diffuser as claimed in any one of claims 1 to 7 wherein said flow passage is of multi-sided cross section wherein said flow passage is defined by a plurality of aerofoil section members which are angled to each other.

12. A diffuser as claimed in claim 6 wherein respective said aerofoil section members from the constricted region rearwardly are angled at an increasing angle to the longitudinal axis of the diffuser.

13. A diffuser as claimed in claim 6 wherein at the leading end of the diffuser, the aerofoil section members of the side walls are angled outwardly from the constricted region at 10 to 12 degrees to the longitudinal axis of the diffuser.

14. A diffuser as claimed in claim 6 wherein at the trailing end of the diffuser, the aerofoil section members of the side walls are angled outwardly from the constricted region at 40 to 45 degrees to the longitudinal axis of the diffuser.

15. A diffuser as claimed in any one of the preceding claims wherein the aerofoil section members comprise asymmetric aerofoil section members.

16. A diffuser as claimed in clam 3 and including means for adjusting the aerofoil section members to adjust the gap between the aerofoil section members.

17. A diffuser as claimed in claim 16 wherein said aerofoil section members are mounted for pivotal movement about their longitudinal axes and including means for adjusting the pivotal position of the members.

18. A method of generating energy, thc method comprising the steps of providing a diffuser in a naturally occurring fluid flow, said diffuser comprising a flow passage having an inlet and an outlet and a side wall or walls between said inlet and said outlet, said side wall or walls being defined by a plurality of members of an aerofoil cross section and said flow passage having a constricted region between said inlet and said outlet, and driving an energy take-off means with a prime mover positioned in the constricted region, the prime mover being configured to move in response to the flow of fluid through the constricted region.

19. Apparatus for generating energy, the apparatus comprising a diffuser comprising a flow passage having an inlet and an outlet and a side wall or walls between said inlet and said outlet, said side wall or walls being defined by a plurality of members of an aerofoil cross section, said flow passage having a constricted region between said inlet and outlet and a prime mover positioned in the constricted region to drive an energy take-off means, the prime mover being configured to move in response to the flow of fluid through the constricted region.

20. Apparatus as claimed in claim 19 wherein said prime mover comprises a turbine having a rotatably mounted shaft and blades supported on or to the shaft.

21. Apparatus as claimed in claim 20 wherein said blades are spaced radially from, and extend parallel to, the shaft and are of an aerofoil cross section.

22. Apparatus as claimed in claim 21 wherein said blades are mounted so as to be capable of limited pivotal movement about their longitudinal axes.

23. Apparatus as claimed in claim 22 wherein damping means are provided to damp pivoting movement of the blades.

24. Apparatus as claimed in claim 23 wherein an arm is fixed to each blade for pivotal movement therewith, said arm being associated with the damping means.

25. Apparatus as claimed in claim 24 wherein said damping means comprise hydraulic damping means including a piston and cylinder for damping pivotal movement of the blades in opposite directions.

26. Apparatus as claimed in claim 25 wherein said cylinder includes an opening to allow limited flow of fluid to and from the cylinder upon movement of the piston therein in opposite directions.

27. Apparatus as claimed in claim 25 or 26 wherein said arms of the blades are pivotally connected to the respective pistons of the hydraulic damping means.

28. Apparatus as claimed in any one of claims 25 to 27 and including stop means for limiting pivotal movement of the blades.

29. Apparatus as claimed in claim 28 wherein said stop means are provided in the path of movement of the arms to limit pivotal movement of the arms and thus blades in a first direction.

30. Apparatus as claimed in claim 29 wherein said damping means limit the pivotal movement of the arms and blades in the opposite direction.

31. Apparatus as claimed in any one of claims 19 to 30 wherein said aerofoil section members are arranged in series between the inlet and outlet and wherein other than at the inlet and outlet, a gap or slot is provided between a trailing portion or edge of each aerofoil section member and the leading portion or edge of the adjacent profiled section.

32. Apparatus as claimed in claim 31 and including means for sensing the output of said prime mover and means for adjusting said aerofoil section members to vary the size of said gaps between said aerofoil section members in accordance with the sensed output.